

2005 GIS Emergency Response Field Exercise “Operation Blue Ribbon”

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The Missouri Department of Health and Senior Services GIS unit sponsored a critical incident exercise June 28-30th in Sedalia, Missouri. “Operation Blue Ribbon” simulated an E. coli outbreak at the Missouri State Fairgrounds. The primary purpose of the exercise was to develop and improve the technical skills of GIS users for Local Public Health Agencies (LPHA). The exercise also tested the emergency functions for GIS professionals at the Missouri Department of Health and Senior Services in their mobile command center.

Personnel from six different LPHAs, University of Missouri Extension office, Kansas Department of Health and Environment, and Missouri Department of Health and Senior Services attended the exercise. The group was divided into smaller teams, with each team containing an array of members, including Regional Bioterrorism Planners, Epidemiology Specialists, and Environmental Public Health Specialists. Each team had a designated GIS professional from DHSS serving as an advisor, which handed out their tasks and provided guidance when needed.

In the simulation, 26 people became ill by the fifth day of the fair, and laboratory tests had confirmed the presence of Escherichia coli 0157:H7. In the scenario, investigators were already on site, and the teams were requested to provide GIS support. There were eight tasks presented to teams throughout the day, involving data collection, processing, analyzing, and displaying of data.

Tasks included using patients’ home addresses to show the effect of the outbreak across the state, and finding the best location for a temporary clinic. Another task had teams using their GPS receivers to return to previous sampling sites and collect additional information from those locations.



Team Blue uses a GPS receiver to find previous sample sites while their advisor looks on.

The epidemiological investigation had teams assisting in three main areas: food vendors, livestock barns, and campgrounds. For the food vendors, investigators had conducted interviews and had a list of all ill persons and the places that they ate. Using GIS, team members were able to quickly show which food vendors were of concern for the investigators.

While interviewing the affected persons, investigators had each individual mark the barns they had visited on a map. These maps were then given to the GIS teams, where they had to compile the data and show which barns had more visits by affected people.

The campground investigation had team members collecting each campsite using GPS receivers, and recording which campers reported feeling ill.

In the final task, teams used GIS to combine food vendor, barns, and campground data. By combining the data together, investigators were immediately drawn to specific area at the fairgrounds.

With the completion of the exercise, teams learned that the source for the E. coli in the scenario was a contaminated livestock barn. Widespread contamination occurred through airborne transmission. Fans spread the pathogen to the nearby campground and eating establishments.



Team Yellow compiles investigative data to locate possible contaminated livestock barns.

Besides the E. coli scenario, participants also listened to presentations on the newest GIS/GPS techniques and concepts. They also completed several desktop and field exercises to learn these new techniques. Participants also met on the final day to discuss the exercise and share information on lessons learned and difficulties encountered.

“Operation Blue Ribbon” was conducted as part of the DHSS Local GIS program. There are currently 26 local health departments participating in this program. GIS professionals at DHSS provide software, training, and support to these agencies. Through this program, GIS is being utilized at the local level for projects such as emergency response, disease investigation, and environmental public health.